Jetstream-31 (J31) Flight Report for INTEX-ITCT
Flight 12 - 21 July 2004

Aerosol profiles and near-surface legs with Aqua. Aerosol gradient at several altitudes?

Overview

This was the sixth J31 flight out of Pease. Goals focused on the Aqua overpass of 1406 EDT (1806 UT).

J31 and its instruments performed well.

Flight Path, Timing, and Measurements

Flight path is shown in Figure 1 below. Engines on ~1246-1526 EDT. Takeoff at 1308 EDT. Block: 2.7 hr. Flight: 2.2 hr.

Found a clear area near point D (43 N, 70 W). Profiled from 17.5 kft to near surface and made near-surface runs at edge of low cloud bank just before and after Aqua overpass. Near-surface runs show AOD(500 nm) gradient, <0.4 to 0.46 see Figure 2 below). Profiled up to 6.5 kft and flew over near-surface leg. AOD gradient noted. Flew additional legs at 11.5 and 17.5 kft. Spiraled down to 200 ft with offset at 2 kft to avoid cloud deck. AOD(500 nm) at 200 ft is ~0.4. Low cloud deck is fog, no chance to underfly. Headed home.

On landing at Pease, AOD(500 nm) was ~0.42.

Instrument Performance

Radar Altimeter: Working well.

Position and Orientation System (POS): Operated by Jim Eilers. Position accuracy from 6 to <1 m throughout flight. Frequent jumps between limits.

Nav/Met: Data displayed by AATS looked good. No data dropouts.

SSFR: On first startup, didn't find one spectrometer. Restarted. Working well before takeoff and throughout flight.

AATS: Tracking well. Hot detector block temperatures held steady, 44 to 45 C. Marine band radio's upper antenna disconnected before flight. Marine band radio not used on this flight (Ron Brown was in Boston Harbor, where J31 could not fly.

Notes, Insights

J31 crew needs to get clear decision 25 minutes before doors close: "We're going. Fuel now."

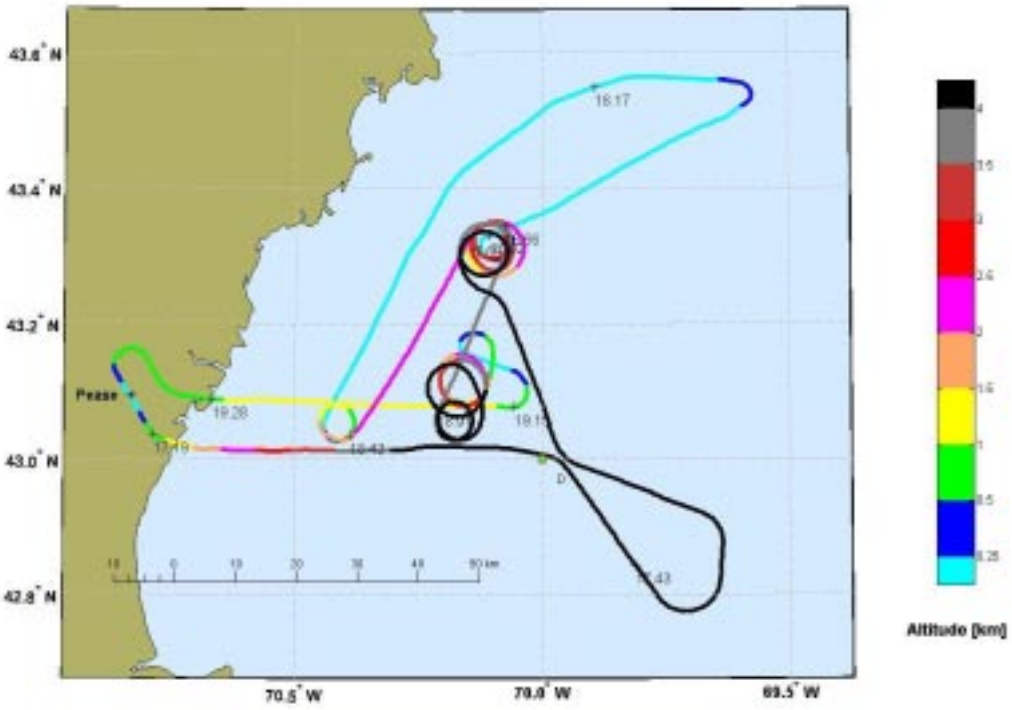

Figure 1. Flight track of J-31, Flight 12, July 21, 2004.

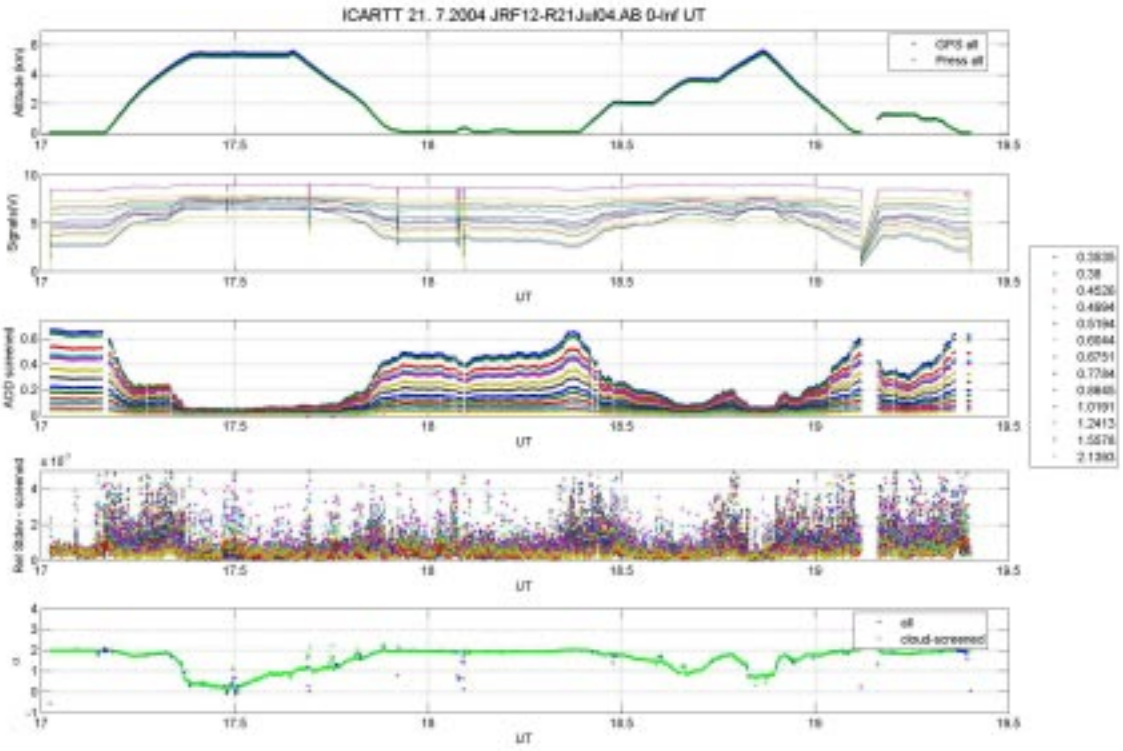

Figure 2. Time series of flight altitude, AATS-14 signals, derived aerosol optical depths, standard deviation of signals, and modified Ångstrom exponent for J-31, Flight 12, July 21, 2004.

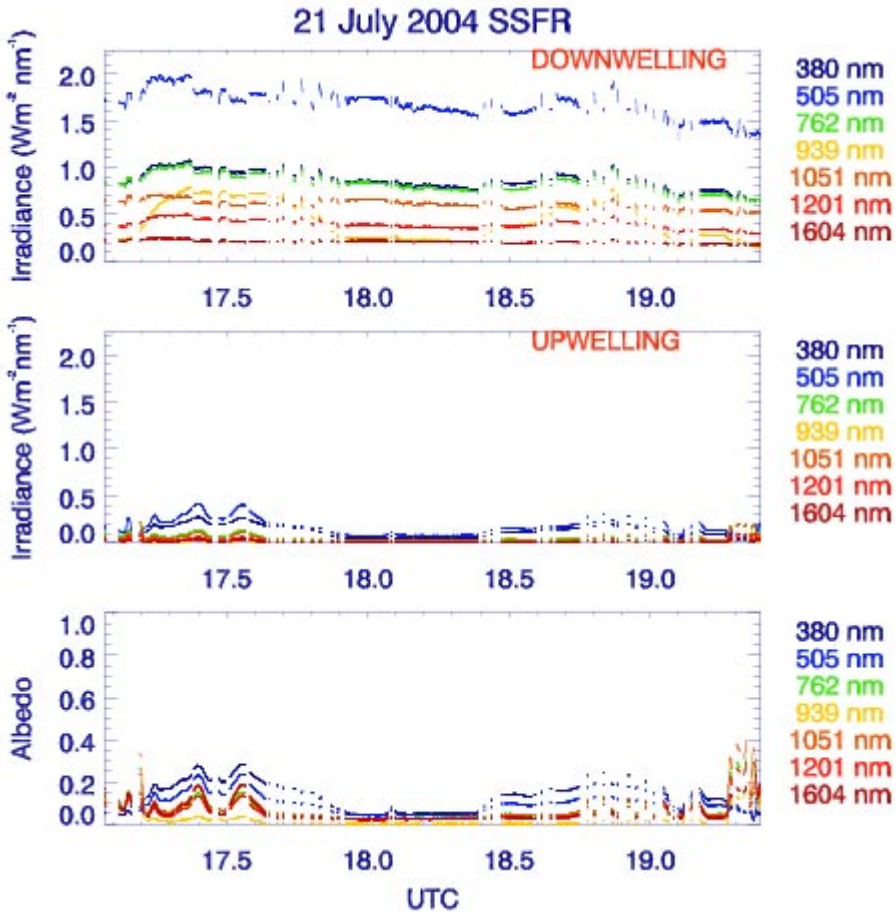

Figure 3. SSFR-measured spectral irradiances and albedo from Flight 12.

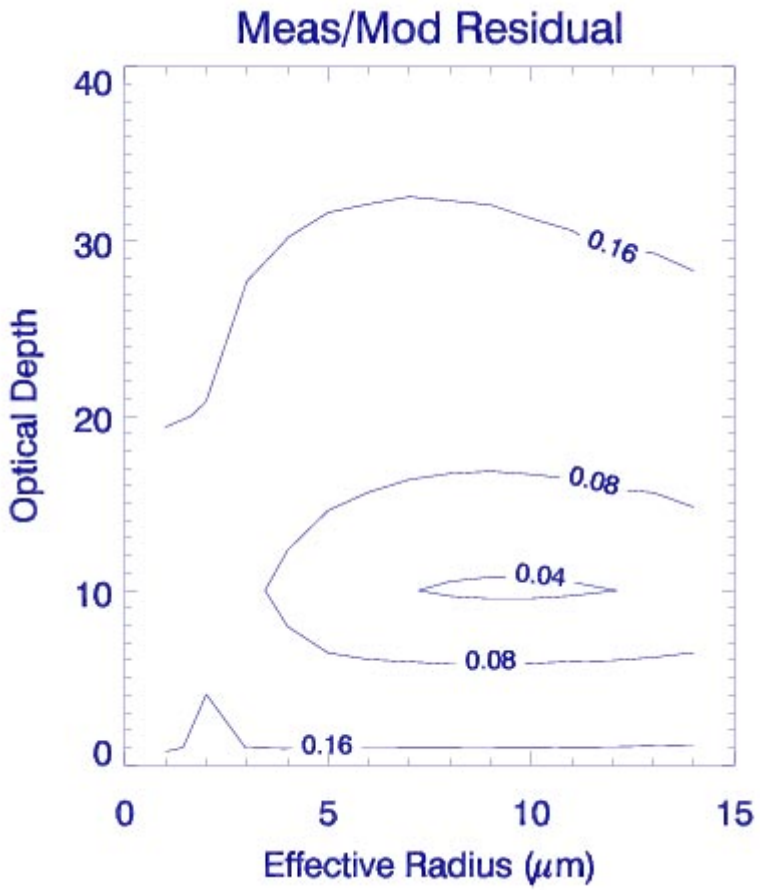

Figure 4. Contours of residual between SSFR measurement and model albedo in Figure 3. Minimum residual indicates a cloud of optical thickness 10 and effective radius in the range of 8-12 microns.